Immunochemical Techniques

Part E
Monoclonal Antibodies and General Immunoassay Methods

EDITED BY
John J. Langone
DEPARTMENT OF MEDICINE
BAYLOR COLLEGE OF MEDICINE
HOUSTON, TEXAS

Helen Van Vunakis
DEPARTMENT OF BIOCHEMISTRY
BRANDEIS UNIVERSITY
WALTHAM, MASSACHUSETTS

1983

ACADEMIC PRESS
A Subsidiary of Harcourt Brace Jovanovich, Publishers

New York London
Paris San Diego San Francisco São Paulo Sydney Tokyo Toronto
Table of Contents

CONTRIBUTORS TO VOLUME 92 ................................. ix
PREFACE ............................................................ xiii
VOLUMES IN SERIES ................................................ xv

Section I. Hybridoma Technology

A. Production of Monoclonal Antibodies with Selected Applications

1. Human–Human Monoclonal Antibody-Producing Hybridomas: Technical Aspects
   LENNART OLSSON AND HENRY S. KAPLAN 3

2. Methods of Enhancing the Frequency of Antigen-Specific Hybridomas
   REUBEN P. Siraganian, PHILIP C. FOX, AND ELSA H. BERENSTEIN 17

3. Spleen Cell Analysis and Optimal Immunization for High-Frequency Production of Specific Hybridomas
   C. STAHLI, TH. STAHELI, AND V. MIGGIANO 26

4. Estimation of the Number of Monoclonal Hybridomas in a Cell-Fusion Experiment
   ANGEL L. DE BLAS, MAKARAND V. RATNAPARKHI, AND JAMES E. MOSIMANN 36

5. Use of Human Endothelial Culture Supernatant (HECS) as a Growth Factor for Hybridomas
   GIULIA C. B. ASTALDI 39

6. Production, Purification, and Characterization of Antigen-Specific Murine Monoclonal Antibodies of IgE Class
   AMAR S. TUNG 47

7. Production and Properties of Monoclonal Antibodies to Guinea Pig Ia Antigens
   STEVEN E. ZWEIG AND ETHAN M. SHEVACH 66

8. Purification of Murine MHC Antigens by Monoclonal Antibody Affinity Chromatography
   MATTHEW F. MESCHER, KATHRYN C. STALLCUP, CATHLEEN P. SULLIVAN, AARON P. TURKEWITZ, AND STEVEN H. HERRMANN 86

9. Monoclonal Antibodies against HLA Products and Their Use in Immunoaffinity Production
   PETER PARHAM 110–

10. Immunoassay for Sequence-Specific DNA-Protein Interactions
    RONALD MCKAY 138
# TABLE OF CONTENTS

## B. Detection and Assessment of Monoclonal Antibodies

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Quantitation of Hybridoma Immunoglobulins and Selection of Light-Chain Loss Variants</td>
<td>Timothy A. Springer</td>
<td>147</td>
</tr>
<tr>
<td>12</td>
<td>Indirect $^{125}$I-Labeled Protein A Assay for Monoclonal Antibodies to Cell-Surface Antigens</td>
<td>Joseph P. Brown, Karl Erik Hellström, and Ingegerd Hellström</td>
<td>160</td>
</tr>
<tr>
<td>13</td>
<td>Enzyme-Linked Immunosorbent Assay for Screening Monoclonal Antibody Production Using Enzyme-Labeled Second Antibody</td>
<td>J. Y. Douillard and T. Hoffman</td>
<td>168</td>
</tr>
<tr>
<td>14</td>
<td>Rosette-Forming Cell Assay for Detection of Antibody-Synthesizing Hybridomas</td>
<td>Pierre Legrain, Dominique Juy, and Gérard Buttin</td>
<td>175</td>
</tr>
<tr>
<td>15</td>
<td>Rapid Screening and Replica Plating of Hybridomas for the Production and Characterization of Monoclonal Antibodies</td>
<td>Richard B. Bankert</td>
<td>182</td>
</tr>
<tr>
<td>16</td>
<td>Use of High-Resolution Two-Dimensional Gel Electrophoresis for Analysis of Monoclonal Antibodies and Their Specific Antigens</td>
<td>Terry W. Pearson and N. Leigh Anderson</td>
<td>196</td>
</tr>
<tr>
<td>17</td>
<td>Screening of Monoclonal Immunoglobulins by Immunofixation on Cellulose Acetate</td>
<td>M. A. Pizzolato</td>
<td>220</td>
</tr>
<tr>
<td>18</td>
<td>A Solid-Phase Immunofluorescence Assay (SIFA) for Detection and Characterization of Monoclonal Antibodies against Soluble Antigens</td>
<td>Burkhard Michiel, Helmar Fiebach, and Uwe Karsten</td>
<td>227</td>
</tr>
<tr>
<td>19</td>
<td>Identification and Characterization of Lymphocyte Hybridomas by Electrophoresis of Glucose-6-phosphate Isomerase Isozymes</td>
<td>Thomas J. Rogers and Kathleen O'Day</td>
<td>237</td>
</tr>
</tbody>
</table>

## C. Section II. Immunoassay of Antigens and Antibodies

### A. Labeling of Antigens and Antibodies

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Iodine Monochloride (ICl) Iodination Techniques</td>
<td>M. Angeles Contreras, William F. Bale, and Irving L. Spar</td>
<td>277</td>
</tr>
</tbody>
</table>
23. Application of High-Performance Liquid Chromatography to Characterize Radiolabeled Peptides for Radioimmunossay, Biosynthesis, and Microsequence Studies of Polypeptide Hormones

N. G. Seidah and M. Chrétien

24. Preparation of Stable Radiiodinated Polypeptide Hormones and Proteins Using Polyacrylamide Gel Electrophoresis

Susanne Linde, Bruno Hansen, and Ake Lernmark

B. Separation Methods in Immunoassay

25. Noncentrifugation Immunoassays: Novel Systems

Michael Cais

26. Use of Activated Thiol-Sepharose in a Separation Method for Enzyme Immunoassay

Kanefusa Kato

27. Affinity Exclusion: A New Method for the Separation of Free and Bound Fractions in Enzyme Immunoassay

B. Terouanne and J. C. Nicolas

28. Use of Chromatography Tubes in the Separation of Bound and Free Fractions in Radioimmunoassay


C. Immunoassay Methods

29. Enzyme-Linked Immunelectrotransfer Blot Techniques (ETB) for Studying the Specificities of Antigens and Antibodies Separated by Gel Electrophoresis

Victor C. W. Tsang, Jose M. Peralta, and A. Ray Simons

30. Quantitative, Single-Tube, Kinetic-Dependent Enzyme-Linked Immunosorbent Assay (k-ELISA)

Victor C. W. Tsang, Britt C. Wilson, and Jose M. Peralta

31. Immunoassay Using Antigen-Coated Plastic Tubes and Radiolabeled or Enzyme-Labeled Protein A

Adrian P. Gee and John J. Langone

32. Colorimetric Immunoassays Using Flavin Adenine Dinucleotide as Label

David L. Morris and Robert T. Buckler

33. Bioluminescent Immunoassays

Jon Wannlund and Marlene DeLuca

34. Immunoassay by Electrochemical Techniques

Kenneth R. Wehmeier, Matthew J. Doyle, H. Brian Halsall, and William R. Heineman

35. Metalloimmunoassay: Principles and Practice

Michael Cais

36. Fluorescence Fluctuation Immunoassay

V. B. Elings, D. F. Nicoli, and J. Briggs
TABLE OF CONTENTS

37. Methods and Application of Hapten-Sandwich Labeling  LEON WOFSY  472
38. Use of Lectin–Antibody Conjugates for Quantitation and Titration of Antigens and Antibodies  JEAN-LUC GUESDON AND SYRATS AVRAMEAS  489
39. Partition Affinity Ligand Assay (PALA) for Quantifying Haptens, Macromolecules, and Whole Cells  BO MATTIASSON  498
40. Preparation and Applications of Multivalent Antibodies with Dual Specificity  V. GHEȚIE AND I. MORARU  523

D. Data Analysis

41. LIGAND: A Computerized Analysis of Ligand Binding Data  PETER J. MUNSON  543
42. Two Simple Programs for the Analysis of Data from Enzyme-Linked Immunosorbent Assays (ELISA) on a Programmable Desk-Top Calculator  D. G. RITCHIE, J. M. NICKERSON, AND G. M. FULLER  577
43. Determination of Affinity and Specificity of Anti-Hapten Antibodies by Competitive Radioimmunoassay  ROLF MÜLLER  589
44. Methods of Measuring Confidence Limits in Radioimmunoassay  ROBERT C. BAXTER  601

AUTHOR INDEX  611
SUBJECT INDEX  629